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**Title:** Integrating health education in academic lessons: is this the future of health education in schools: a commentary

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This commentary makes the case for a systematic review examining the potential of interventions that integrate health education into other school subjects. Many schools are reducing their provision of personal, social and health education (PSHE) lessons in the UK and fewer teachers are being trained in teaching this subject.<sup>1-4</sup> Similar marginalization of health education has been noted in other countries such as the USA.<sup>5-7</sup> This reduction has occurred in the UK partly because PSHE is not a statutory requirement—the UK government recently rejected advice that it should be.<sup>8</sup> Furthermore,, the process of ‘marketization’ of school admissions with parents using local league tables of academic performance to inform the choice of schools for their children, has led schools to neglect activities that do not contribute to these metrics.<sup>9</sup> This marketization and focus on a narrow range of metrics are also not unique to the UK. Public education systems throughout Europe and North America are subjecting students to more ‘high-stakes’ testing, with governments using the resulting data to manage schools’ performance and help parents choose schools. All of this is driven by the salience of international metrics of attainment as used, for example, by the Programme for International Student Assessment.<sup>10,11</sup>

The decline of PHSE is of particular concern because there is strong evidence from systematic reviews that school curriculum-based health education is one key element in strategies to reduce outcomes such as alcohol consumption,<sup>12</sup> smoking,<sup>13</sup> drug use,<sup>14</sup> violence,<sup>15,16</sup> and teenage pregnancy.<sup>17</sup> As well as improving health, students value health education,<sup>18</sup> which provides them with practical life skills.<sup>3</sup> The importance of educating young people about health is enshrined in the United Nations Convention on the Rights of the Child.<sup>19</sup>

In this context, some schools are delivering health education in other subjects, integrating it with academic learning.<sup>20</sup> For example, in Liverpool, the Ariel Trust is educating students about alcohol within mathematics lessons.<sup>21</sup> Students learn about statistics by exploring examples focused on alcohol such as summarizing patterns of alcohol consumption and exploring the risks associated with different levels of this. In the United

States, many educators have acknowledged the potential value of integrating health and academic education.<sup>22-25</sup> and the pressures to do so particularly following the 2001 No Child Left Behind Act, which emphasizes standardized academic testing for all students.<sup>26</sup>

Even without the marginalization of PSHE, integrating health and academic learning may be an effective strategy to give health issues greater space in the school timetable, providing for larger intervention 'doses' than would otherwise be possible in specific health classes.<sup>20,27</sup> Classes not overtly labelled as health education may also be less prone to student resistance to health messages.<sup>28</sup> If integrated into mainstream academic curricula, there is also potential for greater synergy in and reinforcement of health messaging across different academic lessons.<sup>29</sup> Some educators suggest that integrating learning across subjects is more effective than when offered as a single subject in isolation,<sup>30</sup> developing students' cognitive flexibility.<sup>31</sup> Integrating health and academic education might also increase student engagement with school because addressing health, unlike some academic learning, makes learning feel more relevant to students' lives,<sup>32</sup> which is a benefit in itself as well as being an important protective factor for a range of health outcomes operating at the level of individual students<sup>33</sup> and schools.<sup>34</sup> The theory of human functioning and school organization<sup>32</sup> as well as the social development model<sup>35,36</sup> both suggest that students who are committed to school are less likely to engage in risky behaviors.

However, there are also risks in moving from providing health education in discrete lessons to integrating it into other academic subjects. For example, if the primary focus of a curriculum is to teach mathematics, without a stand-alone lesson on health, classroom time may focus on health-related knowledge but neglect the development of skills, such as peer resistance skills, which have been shown to positively impact decision-making for health.<sup>12,37</sup> Integrating health and academic education within complex school systems may also risk negative or unintended consequences such as hampering academic learning and attainment or adding to the teachers' workloads. Those teaching academic subjects may also lack the training or commitment to provide good teaching of health education. Furthermore, it is likely that to achieve the greatest gains, this integrated approach should be one element of

broader multi-component interventions in schools,<sup>38,39</sup> which also include modifications to school policies, the social environment, and educational policies.<sup>40</sup>

Hence, there is a need to examine how integrating health and academic education is theorized to work, how well it is delivered in practice and its effectiveness in promoting student health. However, at least in the UK, lessons integrating health and academic education<sup>21,41</sup> have not been informed by theory or evidence. The UK can learn from work in other countries.

In terms of theory, interventions that integrate health and academic education might work via a number of mechanisms: by developing social and emotional skills such as self-awareness, self-regulation, motivation, empathy and communication<sup>42</sup> by fostering healthier social support among students<sup>43,44</sup> by promoting knowledge of the costs<sup>41</sup> and consequences<sup>21</sup> of health risk behaviors and how to avoid them; by developing media literacy skills around the advertising of tobacco, alcohol and other health-harming substances; and by modifying students' social norms about health promoting and health risking behaviors.<sup>28,29,41,45,46</sup> Interventions may generate developmental cascades whereby students' progress in accomplishing distinct, seemingly disparate educational and developmental milestones influence one another over time.<sup>47</sup>

Research has started to examine the impact of integration. For example, the "4Rs" (Reading, Writing, Respect and Resolution) program is delivered in American elementary schools to children aged 5–11 years. The program aims to integrate the teaching of social and emotional skills with that of language and the arts. Teachers use children's literature as a basis for educating students, not only in language and literature, but to develop skills and understanding in the areas of anger management, listening, assertiveness, cooperation, negotiation, mediation, building community, celebrating differences and countering bias. The intervention focuses on themes such as conflict, feelings, relationships and community. A randomized trial of 4Rs has reported significant reductions in aggression and improved academic attainment.<sup>43,44</sup> However, a review and synthesis is required to assess the overall weight of evidence for such interventions across a range of health outcomes.

However, while theorization and empirical evaluation is underway there is a need for synthesis. No systematic review has to date examined the evidence concerning interventions of this type. The reviews cited above,<sup>12-17</sup> some of which are now quite old, focus on school-based interventions but the interventions included are overwhelmingly those focused exclusively on health and delivered in traditional health education lessons. Some of these reviews do include some interventions integrating health and academic education but they omit important studies and do not analyze or draw conclusions about the effects of this specific category of intervention. Furthermore, these reviews have not synthesized evidence on intervention theories of change or process evaluations and so cannot provide information about the feasibility and acceptability of interventions or possible unintended consequences for school systems. As such, there is a need for a systematic review that synthesizes: theories of change to examine the mechanisms by which these interventions are intended to work; process evaluations to assess what factors relating to interventions, providers, participants and school contexts affects the implementation of these interventions; and outcome evaluations to determine the effectiveness of such interventions.

Empirical research and evidence synthesis can examine the implementation and effectiveness of interventions that integrate health education into other school subjects and can thus provide useful information for those deciding how to promote health in schools. However, empirical research cannot determine such decisions since it is unlikely to provide information about the long-term consequences of taking an integrated versus a non-integrated approach or about questions of values. However, we would argue that while not sufficient, a synthesis of evidence would nonetheless be extremely useful in informing what must ultimately be political decisions.

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